DOCUMENT RESUME

ED 469 388 FL 027 468

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TITLE	Aspects of the Phonology-Syntax Interface in Akan.
PUB DATE	2002-03-22
NOTE	14p.; Paper presented at the Annual Conference on African Linguistics (33rd, Athens, Ohio, March 22-24, 2002).
PUB TYPE	Reports - Descriptive (141) -- Speeches/Meeting Papers (150)
EDRS PRICE	EDRS Price MF01 Plus Postage. PC Not Available from EDRS
DESCRIPTORS	*Akan; Foreign Countries; Grammar; Language Patterns; Nouns; *Phonology; Phrase Structure; *Suprasegmentals; *Syntax; Uncommonly Taught Languages
IDENTIFIERS	Cote d Ivoire; Ghana

ABSTRACT

This paper discusses the phonology-syntax interface in Akan, a language spoken in Ghana and the Cote d'Ivoire, describing a medium of exchange between phonology and syntax. Studies in lexical phonology have distinguished two levels in phonology--lexical and post-lexical--based on how and where phonological rules apply, although some phonological rules also occur at both levels. At the post-lexical level, the phonological rules normally require a particular domain of application, without which they fail to be triggered. The question is where and how to define these domains. The paper discusses aspects of the phonology-syntax interface, referring to noun-noun and noun-adjective phrasal word (compound) constructions, which come along with both tonal and segmental rules applying on the dictates of some constraining conditions. Assuming that the domain of post-lexical rule application is drawn from the prosodic component, the paper argues that although the influence of syntax cannot be undermined, it should not have directly influence the phonology. That is, syntactic inputs and even some phonological information constitute structures underlined in the prosodic hierarchy. (Contains 11 references.) (SM)

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Aspects of the Phonology-Syntax Interface in Akan

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Abstract

This paper discusses some aspects of the phonology-syntax interface in Akan, a language spoken in Ghana and the Cote d'Ivoire on the proposition that there is a medium of exchange between phonology and syntax. Studies in Lexical Phonology (Mohanan 1982 & 1986; Kiparsky 1982 & 1985; Pulleyblank 1986) have distinguished two levels in the phonology - lexical and post-lexical levels - based on how and where phonological rules apply, although some phonological rules are also found to occur at both levels. At the post-lexical level, we also realize that the various phonological rules normally require a particular domain of application without which they fail to be triggered. The question that follows this observation is where and how we define these domains. With reference to 'noun-noun' and 'noun-adjective' phrasal word (compound) constructions, which come along with both tonal (i.e. H-deletion and H-insertion) and segmental (i.e. Diphthong simplification) rules applying on the dictates of some constraining conditions, this paper touches on some aspects of the phonology-syntax interface. On the assumption that the domain of post-lexical rule application is drawn from the prosodic component (Selkirk 1981 & 1986, Nespor and Vogel 1982 & 1986 and Hayes 1989), this paper argues that although the influence of syntax cannot be undermined, it should not have a direct influence in the phonology. That is, syntactic inputs and even some phonological information constitute structures underlined in the prosodic hierarchy (Selkirk 1981 & 1986). Finally, the paper claims that in the prosodic component processes are better defined, integrated and accounted for without resorting to the identification of various environments within which a particular rule can or cannot occur as the syntactic component would always predict.

0. Introduction

Lexical phonology (Mohanan 1986; Kiparsky 1985, etc.) brought in its wake the observation that many lexical phonological rules could also be defined to apply beyond the phonological word. These were referred to as post-lexical or phrase-level rules. In Akan how these post-lexical rules apply call for an examination into the relationship between syntax and phonology, with respect to the information flow. This is because some post-lexical rules require a particular

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pseudo-syntactic bracketing – i.e. structures in the prosodic hierarchy (Selkirk 1981, Nespor and Vogel 1982 etc.) rather than in the syntactic component – to be triggered.

This paper discusses the 'noun-noun' and 'noun-adjective' compound/phrasal word constructions (NP-internal constructs) and the associated processes on the face of the phonology-syntax interface through the theoretical framework of prosodic phonology (Nespor and Vogel 1986). The phonological phrase, as the reference domain of the processes to be discussed in this paper, proposed with the end-based (Selkirk 1986) and the relation-based (Selkirk 1984, Nespor and Vogel 1986) algorithms in perspective for Akan is as in (1).

(1) *Phonological Phrase Formation (algorithm)*

a. In a tensed clause (IP), all contentive constituents before the verb phrase together while all constituents following the verb are also phrased together with the verb.
b. Within these two basic structures:
    i. Intonationally emphasized (by maintenance of lexical tones) heads phrase alone.
    ii. Morphophonemically marked non-head constituents also phrase separately.
c. All other lexical constituents involved in the utterance, which may not be affected by the statements above (a & b), are phrased separately.

We set off in section 1 to look at Akan Noun-Noun and Noun-Adjective phrasal word/compound construction, and the processes in them. The domain of application of such processes will be determined to enforce the prosodic hierarchy and also highlight our proposal in (1) in the course of our discussion. This will provide an impetus to our bid to explain the lack of isomorphy between the syntactic component domains and those of post-lexical phonological rules. Section 2 will look at the morphophonemic property of number (plurality) and its influence on the phrasal word construction. We will then conclude, reiterating that if syntax should directly dictate the domains of phonological rules, there would be irregularities in rule application and accounting.

1. NP-internal processes

In connected speech within the NP in Akan, some syntactic forms and phonological processes normally occur with respect to tones and segments. Compounding, one way by which Akan increases its stock of vocabulary, is one of the forms and provides some of such tonal and segmental alterations. It is done through the association of same or different words from the various parts of speech. In this paper we dwell on Noun-Nouns (N-N) and Noun-Adjective (N-Adj) compounds.

Variously discussed as involving morphosyntactic processes, a compound is traditionally defined as a 'new' word made out of other existing and independent words. According to Anderson (1985), it involves a combination of stems from the lexicon into a quasi-syntactic structure. Although the Akan situation fits into Anderson's definition, we suggest a more general term for Akan – i.e. *phrasal word* – to stay away from the controversy surrounding the definition of a compound.[1] We therefore define a phrasal word as "*a word, which is underlyingly composed of two or more lexical or free constituents*". Phrasal word construction is one of such areas where the connection between syntax and phonology is manifested.

1.1. N-N phrasal word

In N-N phrasal word constructions, we witness, as Dolphyne (1988) rightly points out that the first noun (N1) modifies the second one (N2). A phrasal word could be lexicalized (see data in (4) & (7)), and when lexicalized the individual meaning of constituents may not be explicitly evident in the meaning of the derived word and the modification effect may be overshadowed but not totally lost. This constitutes the main difference between lexicalized and non-lexicalized phrasal words, but we classify both of them as syntactic constructs.

[1] See Lieber 1980; Selkirk 1982; Aronoff 1982; Anderson 1985 etc for detail discussions on compounds

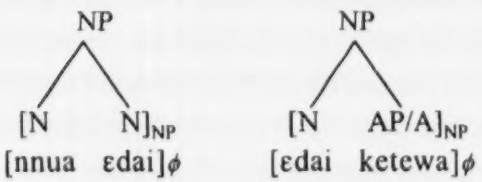
1.1.1. Basic rule of construction

In the construction of N-N phrasal words, like the change of the position of primary stress in English compounds, the basic tonal alteration we witness here is that N1 gets rid of its stem non-low tones and pronounce low by default before the N2 or the adjective (Adj). We name this rule '*H-DELETION*' as it operates in (4), (5) and (6). We contend that the rule as schematized in (2) generally has the phonological phrase (hereafter, ϕ-phrase) as its domain as structured in (3), which at this stage equals the direct syntax projection. As we go on, it will be made evidently clear that although a syntactically sensitive rule, the domain is not obtained in the syntax. So, where constituents involved in the sequence fail to phonologically phrase together as the prosodic component stipulates, although the phrasal word may be derived, H-deletion fails to show up on N1 in the construction. We will exemplify this point in the course of our discussion.

(2) *The H-deletion rule*[2]

$$H\ \text{stem}]_{\omega} \rightarrow L\ \text{stem}]_{\omega}\ /\ [__\ [N2]_{\omega}]_{\phi}$$

(3)



(4) *N1 as LH pattern (Lexicalized)*

a.	òdwâî	ònînî	'a sheep, a male'	→ (ò)dwànînî 'a ram'
b.	ànî	ǹsúó	'the eye, water'	→ (à)nìsúó 'tears'
c.	ǹyàmé,	àsém̀	'a god, a story'	→ ǹyàmèsém̀ 'the scriptures'

(5) *N1 as LH pattern (Non-lexicalized)*

a.	(ò)nùá,	ɔ̀dɔ́	'sibling, love'	→ (ò)nùàdɔ́ 'brotherly love'

[2] The H-deletion rule would more appropriately be called 'Non-Low-Deletion' to include the downstep high, but for convenience and standard terminology usage, we adopt the term 'H-deletion' and note that with its application no distinction is made between a high tone and a downstep high tone.

b.	kɾ̀ɔ̀nóó,	àdéɛ́	'thievery, a thing'	→ kɾ̀ɔ̀nòdéɛ́ 'a stolen good'
c.	ǹnùá,	(ɛ̀)dâî	'woods, house'	→ ǹnùàdâî 'a wooden house'

(6)[3] *N1 as H!H pattern*

a.	(ɛ̀-)dwóǹ!sɔ́,	èdâî	'urine, house'	→ dwònsɔ̀dâî 'urinal'
b.	(m̀-)mó!gyá,	àsɛ́ḿ	'blood, story'	→ mògyàsɛ́ḿ 'a serious matter'
c.	(ɔ̀-)bó!sóḿ	èfié	'idol, house'	→ bòsòm̀fié 'a shrine'

In each case of the illustration in (4), (5) and (6) therefore, we witness in the resulting phrasal words that by the consistent H-deletion rule, the H tones of the N1s are deleted, thus the rule cannot be disregarded.

1.1.2. Condition for H-deletion

Much as H-deletion is enforced without any attention to segmental representations in N1, it is highly constrained by its tonal pattern constitution. Accordingly, where the N1 constituent of N-N compound is L-final and or H-initial (i.e. either H or HL) it remains tonally intact in the construction as the data in (7) demonstrate.

(7) *Failure to H-deletion*

lɔ́rì, èkwâî	'automobile, a way'	→ lɔ́rìkwâî	'a street'
òwúrà, kwà:kú	'lord, PN'	→ òwúrà-kú	'a proper name (PN)'
ádàsà, m̀má	'mankind, children'	→ ádàsàmá	'mankind'
táyà, àkóɾɛ́	'catapult, tree branch'	→ táyà kóɾɛ́	'a branch for catapult'

The illustration in (7) therefore leads us to define the condition under which H-deletion should apply. We need to realize, however, that although this tonal constraint stemming from N1 checks the application of H-deletion, it does not block the formation of the phrasal word. This seemingly irregularity will be explained along with a few exceptional cases in section *1.1.4* where we will draw on the essence of the prosodic component.

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[3] All the N1s in (6) underlyingly have a L-toned nominal syllabic prefix shown in the brackets, hence the ability to delete their Hs before N2. The brackets indicate optionality of a prefix.

Following the inability of H-deletion to apply in (7), we claim that there is an active constraint, which requires that an initial L of N1 is needed to activate the H-deletion rule, and for default L to takeover. Also, a final L blocks an assignment of the default L to N1, hence the condition, '*WORD-EDGE*' for H-deletion stated in (8) of which N1s in (7) fail to meet.

(8) *Word-edge condition*

"H tones of N1 should delete in N-N phrasal words where its initial and final tones are L and H respectively".

1.1.3. Exceptions to H-deletion

One would expect that in the ϕ-phrase, whenever the condition stated in (8) is met on the N1, H-deletion should take place, but this is not the case. There are a few N-N phrasal words within which H-deletion does not apply on N1s, although they satisfy the word-edge condition. Some of these phrasal words, we will for now refer to as exceptions, are as exemplified in (9).

(9) *Exceptional cases*

àkókɔ́, ɔ̀nînî	'chicken, male'	→ àkókɔ̀nînî	'cockerel'
ɔ̀máî, ɔ̀bá	'country, child'	→ ɔ̀máábá	'citizen'
àsɔ́ré, èdâî	'worship, building'	→ àsɔ́ré!dâî	'church'
yàréɛ́, m̀pá	'sickness, a bed'	→ yàré!pá	'sick bed'

In the syntactic component the data in (9) will just be regarded as exceptions, but under the prosodic account we can conveniently argue that these examples are no exceptions at all by resorting to the 'tonal prominence' phenomenon.[4] Like Yoruba and Bambara, Akan assigns tones to stem syllables at the lexical level through its attested tonal patterns. Since tone is not generally assigned post-lexically to infer accentual structures as pitch-accent languages do, we propose that at the lexical level an assigned tone or tonal pattern is also inherently stressed. However, we do not expect to maintain the pattern at the post-lexical level as in the phrasal

[4] We discuss 'tonal prominence' in this paper as tone or tonal pattern maintenance in the face of a particular rule application that should have affected the tones.

word construction. This means that these lexical tones are also open to alterations at the post-lexical level where a particular rule has to affect them. In such circumstances, their failure to submit to such a rule after its triggering conditions have been met cannot be overlooked.

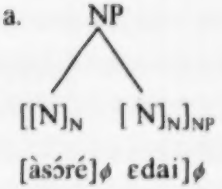
Following the 'tonal prominence' assumption, we propose that there is a prominence maintenance rule (let us call it *PROM(inence)*), though not distinctive, which requires N1s to maintain their lexical tones. *PROM* therefore outranks *WORD-EDGE*, which would have prompted the application of H-deletion. This goes to explain the fact that the situation in (9) is not an exception, but rather a satisfaction of a dominant constraint. Again, we note that the satisfaction of *PROM* does not necessarily block the formation of the phrasal word but the H-deletion rule. In the following, we address the need for the prosodic structures and the issue that H-deletion adopts its domain of application in the prosodic component, otherwise, it should also have applied in the data in (9).

1.1.4. Phrasing and re-phrasing

On the phonology-syntax interaction, what the examples in (9) indicate is that even on the constitution of the ϕ-phrase, the syntactic terminal nodes alone do not make up the inputs as point (b) of our ϕ-phrase algorithm in (1) points out. Some phonological properties also come into play without which an explanation to the existence of the phrasal words in (9) will be distorted, if not impossible, and the non-occurrence of H-deletion on N1s on the achievement of syntactic branching cannot be explained. However, with the prosodic account, the phrasal word formation possibility in (9) without the occurrence of the H-deletion rule is made simple.

We propose that, the lexical tone maintenance (*PROM*) on N1 in the post-lexical environment enabled it to phrase separately as in (10a), and this blocks H-deletion, which strictly requires two contentive words in a ϕ-phrase. Also, (10a) underscores the lack of isomorphy between the syntactic and the prosodic domains. Structured in (10b), we further

suggest that N1 initiates a subcategorization frame for ϕ-phrase re-phrasing to ensure the domain for the phrasal word constructions we have in (9).[5] With these proposals, both the phrasal word formation and lack of H-deletion in (9) are adequately accounted for in a common module.

(10) a. 

b. $[\ldots]\phi$ — $]\phi$

Following this subcategorization frame, which allows one phonological phrase within another, an explanation to *tonal assimilation* occurring in (11) is made clear. This domain juncture rule, applying across ϕ-phrases is triggered from the right edge of a ϕ-phrase with a final H and initiated at the left-edge of a succeeding word with single segment prefix.[6] In this case the final H consistently assimilates the L tone prefix of the succeeding word by deletion as in the non-downstep cases (11a & b) or by dislodging, also shown in downstep cases (11c & d) even if its bearing unit is deleted.

(11) *Tonal assimilation*

a.	àkókɔ́, ònînî	'chicken, male'	→ àkókɔ́nînî	'cockerel'
b.	ɔ̀máî , ɔ̀bá	'country, child'	→ ɔ̀máábá	'citizen'
c.	àsɔ́ré, ɛ̀dâî	'worship, building'	→ àsɔ́ré!dâî	'church'
d.	yàréɛ́, m̀pá	'sickness, a bed'	→ yàré!pá	'sick bed'

Returning to the data we have given so far (some repeated in (12b)) there emerges another constraint, which checks the occurrence of a boundary sequence of different vowels. Except where the final vowel of a diphthong in N1 is /a/, the diphthong is simplified through vowel

[5] This analysis is motivated by Inkelas (1989) and Zec & Inkelas (1990) proposition of a phonological word subcategorization frame on which we build our phonological phrase subcategorization frame.
[6] See Selkirk (1980); Vogel (1984); Nespor & Vogel (1986); Rice (1990) etc. for discussions on domain-sensitive rules, i.e. domain span, domain limit and domain juncture rules and where each of them applies.

shortening or lengthening and the prefix in N2 deleted. We refer to the simplification as '**MID-DIPH*' stated in (12a) and its impact realized in (12b).

(12a) **MID-DIPH*

"Diphthongs are prohibited at the boundary of constituents involved in a phrasal word".

(12b)	òdwâî,	ònînî	'a sheep, a male'	→ (ò)dwànînî	'a ram'
	sɔ́!fɔ́ɔ́,	èfié	'priest, house'	→ sɔ̀fɔ̀fié	'a mission house'
	ɔ̀máî,	ɔ̀bá	'country, child'	→ ɔ̀máábá	'a citizen'
	ǹnùá,	èdâî	'woods, a house'	→ ǹnùàdâî	'a wooden house'

Although, not in the strictest sense as does H-deletion, **MID-DIPH* also adopts the ϕ-phrase as its domain of operation, hence the simplification at the word juncture in (12b). Otherwise, where the constituents involved enter into separate phonological phrases without a chance of subcategorization, the rule ceases to apply. This is discussed and clearly exemplified in section 2, but let us first look at N-Adj phrasal words.

1.2. N-Adj phrasal words

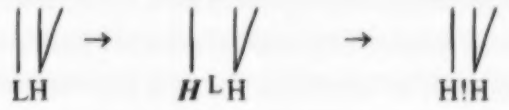
In Akan, adjectives come after the noun they modify in a phrase. In a phrasal word construction of a noun and an adjective, this order is reflected in all of them. We exemplify some of them in (13).

(13)	Noun	Adj		Phrasal word	
a.	dàdéɛ́,	(kété)wá	'metal, small'	→ dàdèwá	'a nail'
b.	àsɛ́ḿ,	húnú	'a talk, useless'	→ àsɛ̀m̀húnú	'nonsense'
c.	sìká,	kɔ̀kɔ̀ɔ́	'money, red'	→ sìkàkɔ́kɔ̀ɔ́	'gold'
d.	pàpà	kɛ̀séɛ́	'fan, big'	→ pàpà ké!séɛ́	'big fan'

The basic rule here is H-deletion on the first constituent, just as we also witnessed in the N-N situation. However, an additional tonal rule, *H-INSERTION*, also prevails that requires the stem-initial syllable of the Adj to resurface as H-toned in the construction as it is clearly shown in (13c & d). The effect of H-insertion is clearly seen where the affected syllable is lexically L.

In this case, the L tone is displaced or delinked by the inserted H, depending on whether the succeeding syllable is H or also L respectively. If the following syllable is H, its pitch level is reduced by the impact of the displaced L, hence downstepped. This is structured and illustrated in (14a) and (14b) respectively.

(14a) k ɛ̀sé ɛ́ → kɛ́ s ̀é ɛ́ → kɛ́!sé ɛ́

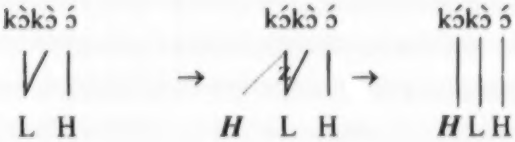


(14b)

sìká, kɛ̀séɛ́	'money, big'	→ sìkà kɛ́!séɛ́	'big money'
ǹtòmá, tùntúḿ	'cloth, black'	→ ǹtòmà tún!túḿ	'black cloth'

Alternatively, where the second syllable is L, then by the obligatory contour principle ((OCP) Goldsmith 1976; Odden 1986 etc.) we assume that no L is set afloat because the initial syllable had shared in a common L and so has just been delinked from a common tonal tier. Structured in (15a), we also illustrate in (15b).

(15a) kɔ̀kɔ̀ ɔ́ → kɔ́kɔ̀ ɔ́ → kɔ́kɔ̀ ɔ́



(15b)

sĭká, kɔ̀kɔ̀ɔ́	'money, red'	→ sìkà kɔ́kɔ̀ɔ́	'gold'
ǹkwâî, dɛ̀ɛ̀dɛ́	'soup, sweet'	→ ǹkwàà dɛ́(ɛ̀dɛ́)	'sweet soup'

We point out that the *WORD-EDGE* condition to H-deletion in N-N phrasal words does not apply in N-Adj phrasal words. This may be that the N-Adj has an independent set of rules, which is supported by the H-insertion rule on the adjective. On the other hand, we can assume that the H-deletion rule is copied and applied here irrespective of *WORD-EDGE*. The data in (16), therefore, show N1 patterns assuming H-deletion, a situation impossible in N-N phrasal words.

(16) *Dysfunctioning H-deletion*

lɔ́rɪ̀, kétéwá	'lorry, small'	→	lɔ̀rɪ̀ kétété	'a small car'
òwúrà, pápá	'lord, good'	→	òwùrà pá(pá)	'a good master'
dúkù, téntéń	'scarf, long'	→	dùkù téntéń	'a long scarf'
bɔ́tɔ́, fɔ́!fɔ́rɔ́	'a sack, new'	→	bɔ̀tɔ̀ fɔ́!fɔ́rɔ́	'a new sack'

2. Morphophonemic Property: Number

Number is regularly represented by a prefix in the noun in Akan. Almost all Akan nouns are underlyingly prefixed in their singular forms.[7] We therefore consider the singular forms as the unmarked case and without any mutation. The plural forms, marked by the vowel prefix *a*-\ or a syllabic nasal /-N/, are considered the marked case, on which we focus. Nouns with underlying syllabic nasal prefixes are conceptually plural, but are still considered unmarked with the regular singular forms.

2.1. Number and Phonological Phrasing

In N-N sequences, Number as marked is sometimes represented in both constituents for optional agreement or only in N2 just for plurality. In N-Adj sequence, Number occurs in both for grammaticality. When Number occurs in the succeeding constituent in the sequence, the H-deletion rule fails to apply on N1. Also, **MID-DIPH* is not respected as shown in (17).

(17) *Number in succeeding constituent*

a.	ɲyàmé,	ɲ-sɛ́ḿ	'a god, stories'	→ ɲyàmé ḿ!sɛ́ḿ	'issues about God'
b.	ɲnùá,	à-dáî	'woods, houses'	→ ɲnùá á!dáî	'a wooden houses'
c.	sàkúó,	ɲ-nwóḿ	'piano, songs'	→ sàkúó ḿ!nwóḿ	'music from piano'
d.	ɲnàdɛ́ɛ́,	à-sɛ́î	'steels, bowls'	→ ɲnàdɛ́ɛ́ á!sɛ́î	'bowls of steel'

[7] Prefixation is done either by a vowel, except the high ones in the case of Asante-Twi or a syllabic nasal. Some other nouns do not have or are not said with a prefix but in their plural forms, they are prefixed by either a vowel or a nasal. Others also have prefixes in their singular forms, which are simply unchangeable in the plural. These are the uncountable nouns. Examples of these are; *ɲkwáí* 'soup', *ɲtòmá* 'clothing', *èdúé* 'lice', *èmóó* 'rice' etc.

By the occurrence of plurality in the succeeding constituent, the data in (17) underlines point (b) of our ϕ-phrase algorithm in (1). Thus, since H-deletion applies within a ϕ-phrase and not across it, it is just prosodically right that the rule does not apply when number is marked in N2 or in the Adj. So as also exemplified in the N-Adj cases in (18), the starred cases are not testified.

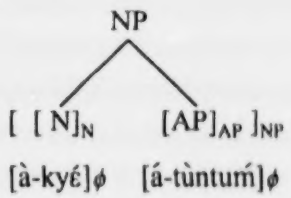
(18) a. à-kyɛ́, à-tùntùm̀ 'hats, black ones'
→ àkyɛ́ átùntùm̀ 'black hats' not *àkyɛ̀ àtùntúm̀

b. ǹ-sékâì, ǹ-kétéwá 'knives, small ones'
→ ǹsékâì ǹ!kétéwá 'small knives' not *ǹsèkàì ǹkétéwá

c. ǹtòmá, à-fitáá 'clothes, white ones'
→ ǹtòmá á!fitáá 'white clothes' not *ǹtòmà àfitáá

H-insertion on Adj also fails as it is seen in (18), but clear in (18a). This affirms the fact that it is triggered at the left edge of a phonological word, but number (creating an extra syllable) at that place foils its domain edge sensitivity. As our ϕ-phrase model in (1) predicts, this syllable renders the adjective, which should have phrased with the noun, morphophonemically complex and phrases alone as in (19). Consequently, H-deletion, H-insertion and diphthong simplification as ϕ-phrase domain-internal rules take place but tonal assimilation applying across phonological phrases occurs as in (18). The prosodic approach of accounting for post-lexical phenomena therefore becomes crucial.

19)



3. Conclusion

We have shown that, in the phonology-syntax connection, structures in the prosodic hierarchy provide the desirable medium for a better explanation of post-lexical phonological processes.

We therefore claim that the syntactic structures just provide the inputs to the creation of the prosodic component. The syntactic component is thus regarded as a means to an end, just as we have shown that some phonological properties do. Through the prosodic component and what goes into it, we have established where and when a particular rule, among those we have discussed, should apply. We noted that H-deletion and diphthong simplification apply within a ϕ-phrase while tonal assimilation apply between ϕ-phrases.

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